

# Public Health in Indonesia

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IN THE NEW NATION of Indonesia, the principles of sound public health practice are being cross-examined and evaluated in relation to some of the most involved problems to be considered by one nation at one time. It is fascinating to observe, for some astute minds are being challenged to find a practical answer to what becomes, as one lives with it, a complex of conundrums. Most of the Indonesian officials who are responsible for making decisions have a local background plus an education in Western medicine and public health methods. This fortunate circumstance insures a realistic compromise with nicely budgeted programs nurtured in lands of economic affluence, but at the same time provides a dissatisfaction with the slow development of preventive medicine in the East.

## A Nation of Islands

Although the Republic of Indonesia is but one of several nations born from the partial collapse of colonialism in Asia, its problems and advantages are such as to place it in a rather unique position in regard to future planning, particularly in public health. The nation

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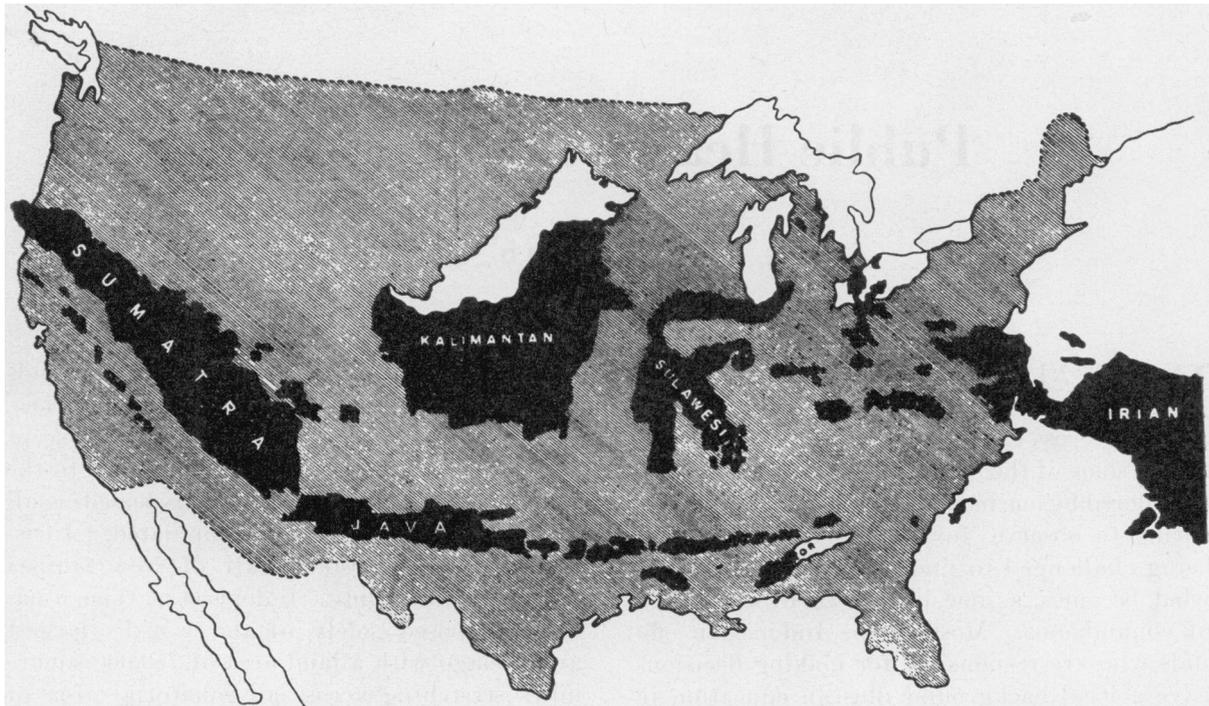
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holds sovereignty over the former Netherlands East Indies, comprising Sumatra, Java, Borneo, Celebes, some 25 smaller satellites which except for Bali and Ambon are scarcely known to the world by name, and 13,000 interspersed small islands of which 2,600 are populated. Jurisdiction of the western half of New Guinea (Irian) is in dispute. Indonesia is, then, a nation composed solely of the world's largest archipelago with a land area of 750,000 square miles stretching across an equatorial area of 3,500 by 1,500 miles. If the northern tip of Sumatra were at New York, New Guinea would lie across North Africa.

## Population Characteristics

Living on these islands is an unevenly distributed population of about 75 million. Java, with 52 million people and 51,030 square miles, has 70 percent of the population and only 7 percent of the land area. This is equivalent to one-third of the population of the United States living in the State of Florida. Density of population in Java averages over 1,000 per square mile. Since much of the island contains the sloping terrain of 50 volcanoes, the population density per square mile in some areas is approximately 1,700—the greatest rural population density in the world. In contrast to this, Borneo, the third largest island in the world, has a population density of about 14 per square mile.

The inhabitants of Indonesia are of Malay descent. The Chinese merchant is everywhere and with the Europeans, Arabs, and Indians forms a minority population of perhaps 2,500,000. Although many languages are used, comprising over 200 dialects, the language is being unified by promulgating "Bahasa Indonesia,"



**Indonesia superimposed on the United States. The Republic of Indonesia, lying between the land masses of Asia and Australia, is a nation composed solely of the world's largest archipelago stretching across an equatorial area of 3,500 by 1,500 miles.**

which is similar to the variety of Malay spoken in the Riouw Archipelago near Singapore. The religions of the Indonesians are derived from the Hindu kingdoms of the seventh and eighth centuries and the Mohammedan infusion in the thirteenth and fourteenth centuries. Hinduism survives in Bali, but over 90 percent of the Indonesians are Moslem. The areas not strongly Moslem at the arrival of the Europeans have been more susceptible to conversion to Christianity, notably the island of Ambon, the northern tip of Celebes, and the area around Lake Toba and Medan in Sumatra.

#### *Climate*

Although the climate of the river bottom lands is tropical in every sense, the mountains, which rise to peaks commonly 10 to 12 thousand feet, provide a range of climate that is quite agreeable. The coastal cities of Java have a climate comparable to our own eastern cities in summer, and a blanket at nighttime is usually needed in the mountain towns.

Except for the more arid Lesser Sunda

Islands, the entire archipelago is carpeted in tropical vegetation, from the coastal swamp lands to the slopes of the volcanoes. In Java, this has given way to agriculture, chiefly in the form of the famous terracing for the rice paddies, and to the agricultural plantations of the Dutch.

#### *Exports*

Although the 3½ years of Japanese occupation, subsequent military actions, and other factors have compromised the export situation, before World War II Indonesia provided 37 percent of the total world's export of rubber, 19 percent of tea, 27 percent of copra, 24 percent of palm oil, 91 percent of quinine, 86 percent of pepper, 72 percent of kapok, 25 percent of hard cordage fibers, 3 percent of petroleum, 17 percent of tin, 5 percent of sugar, and 4 percent of coffee. Of the total export value, 30 percent was in rubber, 21 percent in petroleum, 13 percent in copra and palm oil, 11 percent in tin, and the balance in sugar, tea, and other products.

The exports in 1950 in order of importance

were rubber, petroleum, tin ore, copra, tobacco, tea, and palm oil. The chief consumer countries were the Netherlands, the United States, Singapore, the United Kingdom, Germany, Japan, and Australia.

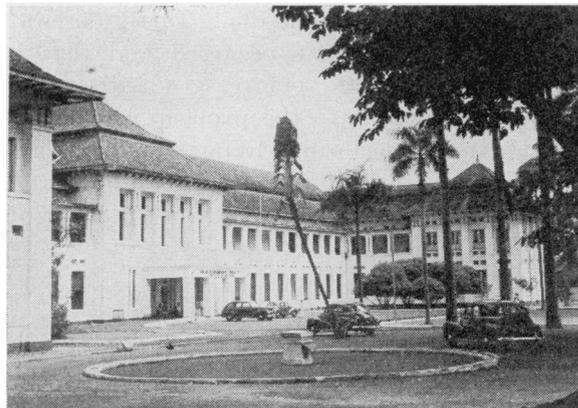
In contrast to its extraordinary beauty and its potential wealth, Indonesia carries a heavy burden of poverty, ignorance, and disease. The individual subsistence level farmer dominates the agricultural pattern, and the rapid increase in population implies a questionable future for Java. Literacy is estimated at 17 percent. Since this is largely in the urban areas, the rural population of 65 million is nearly illiterate.

### The Health of 75 Million

Studies predicated upon limited surveys indicate a birth rate of 28 and a death rate of 20 to 25 per 1,000 a year. Maternal mortality is estimated to be in the neighborhood of 16 per 1,000 live births, and infant mortality varies from 115 to 300 per 1,000 live births a year but has been shown to be higher in some areas. Life expectancy scarcely can be guessed, but the figure of 32 years is commonly used.



**Javanese returning from market. Human excreta is disposed of almost exclusively in the sluggish canal ("kali") on the right, which is also used for bathing and for washing vegetables and clothes. Indonesians, who have a highly developed sense of personal cleanliness, have been slow to appreciate the values of modern sanitation.**



**Associated with the Medical School (above) of the University of Indonesia in Djakarta (Java) is a modern 1,200-bed general hospital. At this school, one of the three medical schools in Indonesia, 25 students were graduated in 1951.**

### *Malaria*

Indonesia is one of the world's great endemic areas of malaria. Carried by both fresh and salt water *Anopheles* which breed throughout the year, the disease is common almost everywhere in the archipelago. In coastal areas, where incidence is apt to be high, the spleen index is frequently 90 percent or more. The incidence by attacks for each year, as in most of Southeast Asia, is estimated at 30 percent, and the annual mortality ranges from 20 to 40 per 1,000 in endemic areas of high incidence. In severe epidemics, records have shown 40 percent of the afflicted population dying from malaria within a year. Malaria certainly causes more deaths in Indonesia than any other disease and has a profound effect upon the economy of the country and upon mortality from diseases with which it occurs concurrently. Tertian and estivo-autumnal forms of the disease are in about equal proportions, with scattered areas of quartan forms in the Lesser Sunda Islands.

### *Tuberculosis*

As in most tropical areas, tuberculosis is impossible to evaluate in statistical terms. There are at least half a million open cases, and it is known to constitute a major cause of death, perhaps 8 to 10 percent of the total. Limited surveys have shown the mortality rate to be 189 per 100,000 a year, but it is probably much

higher. There can be no doubt that a postwar increase in the disease occurred and that it will be many years before a quantitatively adequate approach to the problem can be devised. In the meantime, living conditions are contributing to the spread of tuberculosis, and it will probably emerge as the most difficult of all health problems.

#### *Other Diseases*

Typhoid fever, the paratyphoids, both bacillary and amebic dysenteries and the common diarrheas are extremely widespread throughout Indonesia. War damage and the increase in population contribute to their spread in rural areas, and recent overcrowding severely taxes urban sanitary facilities.

Yaws is found in proportions ranging from 5 percent to 90 percent and averages perhaps 15 percent: it is probable that there are 12 or 15 million cases. It is generally conceded that half of the world's cases of yaws are in Indonesia.

Filariasis has a variable incidence in different islands. It is particularly prevalent on the east coast of Sumatra, in Banka, in the Moluccas, and in the two southern peninsulas of Celebes.

Tropical typhus occurs in most of the islands except Java, and dengue is everywhere. Pneumonia is a common cause of death, particularly in infants. There is an occasional threat of cholera, but the disease must be considered eradicated. After very extensive control measures, plague now appears only sporadically, chiefly in mountain areas of Java. However, as recently as the first half of 1951, there were 2,861 cases and 1,185 deaths reported in Java and Madura. Smallpox has been nearly eradicated at various times but occurs at intervals by reintroduction. Following World War II there were widespread epidemics because the previous extensive vaccination program lapsed during the Japanese occupation. A recent introduction of smallpox from Singapore was traced from Sumatra to Java where it rose to epidemic proportions in West Java in 1948 and resulted in a severe epidemic in 1950 and 1951 in Surabaya. After spreading through eastern Java and Bali and reaching nearby Madura, it was carried by the Madurese fishermen to west and

south Borneo and from there to the Gulf of Bone in Celebes and to Ambon.

Leprosy, trachoma, and leptospirosis are all widespread, with an incidence corresponding to that found in most tropical countries. There are about 70,000 lepers in the nation. Rabies is common among dogs, in West Java particularly. Tetanus neonatorum is a frequent cause of infant mortality, especially in Celebes. Scabies is almost universal with frequent secondary infections. Tropical ulcers, tinea infections, and other tropical skin diseases are everywhere. Hookworm is widespread in the population, with perhaps a 50-percent prevalence in much of Java and 80 percent in the northern and southern peninsulas of Celebes. Ascaris infestation is almost universal, and other forms of helminthiasis abound. The rural prevalence of venereal disease is unknown, but there are indications that it affects not less than 10 percent to 20 percent of the population in urban areas.

Indonesia shares with the rest of Asia the unexplained freedom from yellow fever in the presence of the mosquito vector. Leishmaniasis is rarely encountered and is always imported, and schistosomiasis has been found only in a limited area of central Celebes at the base of the northern peninsula.

#### *Malnutrition*

The actual degree of malnutrition is relative matter in the tropics and is difficult to evaluate. Indications are that most of the inhabitants are living in a borderline state of malnutrition in regard to vitamins, protein, calcium, cholesterol, and iodine. Clinical cases of nutritional deficiency are observed to some degree everywhere and in a high degree in certain areas, particularly in conjunction with postmalarial anemia. Endemic goiter is frequently seen in the mountains of Sumatra, Celebes, Bali, and elsewhere, and edema caused by lack of protein is not uncommon.

Of the vitamin deficiencies, the lack of vitamin A is by far the most predominant, contributing to much eye infection and subsequent blindness. Kidney and bladder stones, possibly connected with a lack of vitamin A, are common, and in some hospitals 10 percent of all pediatric surgery is for this condition.

## Medical Facilities and Personnel

The Ministry of Health of the Republic of Indonesia is responsible for almost all medical and public health services in the nation. It is a highly centralized system working toward decentralization. It has assumed the functions of the former Netherlands East Indies Public Health Services, operates and staffs government hospitals and polyclinics, and controls most of the distribution of medical supplies and equipment. The present organization of the ministry dates from August 17, 1950. Earlier, there was a separate ministry of health at Djogjakarta.

Before the war, there were 207 general hospitals in Java and Madura, with a capacity of 19,022 beds (0.39 beds per 1,000 population). In addition, there were privately owned hospitals, missionary hospitals, and the medical facilities of plantations, petroleum companies, and so forth.

The Ministry of Health reports that in all of Indonesia there are now 600 general hospitals with 55,000 beds and 78 special hospitals and sanatoriums with 11,204 beds. The government owns about 35 percent of all hospital space, but a large part of the remainder is under some form of subsidy.

In 1942, there were 1,700 polyclinics operated by the Netherlands East Indies Public Health Service of which only 500 were in continuous daily use. Only the most important of these clinics were visited daily by a physician. The remainder were usually staffed by specially trained male nurses known as mantris, who frequently were not able to visit each clinic more than once a week. A polyclinic is usually in a small building in the jungle or a room in some community building. Industrial companies, plantations, and estates were charged by law with the care of their laborers. Hence, a close collaboration now exists between the Ministry of Health and these companies.

Before the war the number of physicians was 1,600. Owing to the exodus of many Dutch physicians, there are now fewer than 1,400 physicians in Indonesia, and perhaps no more than 1,000 are actually practicing medicine. This gives a ratio of 1 practicing physician to 75,000 population, which is undoubtedly one of the



**Market scene in Bali. The island lies east of Java in the Lesser Sunda Islands, which include Lombok, Sumba, Sumbawa, Flores, and Timor. Population density on Bali averages about 600 per square mile.**

lowest in the civilized world. Because of the urban concentration of physicians, the rural ratio is often one physician to several hundred thousand population. No less than 20 percent of the nation's physicians are in Djakarta. An offer of government contract service has recently brought a number of European doctors to Indonesia.

### *Medical Schools*

There are three medical schools in Indonesia. The medical school at Djakarta was founded in 1851. The medical school at Surabaya

was founded in 1913. The medical school at Djogjakarta was founded in 1945. The first two are definitely class A institutions by European standards except for the unfortunate loss of faculty and some destruction and looting of equipment during the Japanese occupation. The institution at Djogjakarta is functioning under handicaps but is not compromising its objective of high standards. A fourth medical school is being planned under local auspices at Medan, Sumatra. There are indications that the medical courses may be reduced from 7 to 5 years.

The combined output in 1951 of the 3 existing medical schools was 25 graduates from Djakarta, 3 from Surabaya, and 2 from Djogjakarta, or 30 in all. There is a low government stipend for some students who must then enter government service for a stipulated period. Since many graduates are destined for private practice, and since the government service has little to offer in remuneration, it is difficult to obtain medical personnel for government service. A physician beginning in government service has a starting salary of 280 rupiah (\$25) a month, about the equivalent of the wages of a railway porter. Even a poor physician can make 10 times that much in private practice. Combining private practice with government service is therefore inevitable for the majority of physicians. This is facilitated by the fact that official government working hours are from 7 a. m. to 2 p. m.

The famous Eijkman Institute and the associated Institutes of Nutrition and Malaria are directly under the Ministry of Health. It was at the Eijkman Institute that vitamin B<sub>1</sub> was first isolated in its chemically pure form by Jansen and Donath in 1926. The Institute of Malaria has two branches with good laboratories in Surabaya and Makassar and a third branch under way in Djogjakarta.

Situated in most of the larger cities are central diagnostic laboratories which operate as branches of the Central Laboratory of Djakarta. Vaccines, including the "living" plague vaccine and the famous dried smallpox vaccine of Otten, are produced at the Pasteur Institute in Bandung. All the medical educational institutions are under the Ministry of Education.

## Public Health Organization

The Netherlands East Indies Public Health Service supplanted the former Civil Medical Service in 1925 and was a full-time central public health service with headquarters at Batavia (now Djakarta). Its program was a centralized one until 1934 when provincial health services were organized in Java, Sumatra, and the East Archipelago, under central supervision. By 1937, local health departments had charge of soil sanitation, water supply, sewerage, hospital care, and dispensaries. Decentralization was completed by 1938, and general public health work was also transferred to local authorities and municipalities, an organizational structure which now continues under the central authority of the Ministry of Health.

A large proportion of medical personnel are now employed by the Ministry of Health and the provincial health organizations. In 1937, 651 of 1,135 practicing physicians were employed by the government, and in 1938, 527 of 1,247 physicians.

At the end of 1951, 614 of the slightly more than 1,000 physicians practicing in Indonesia were in government service. The roster of medical and associated medical personnel included:

Physicians.....	614
Pharmacists .....	6
Assistant pharmacists.....	600
Dentists.....	34
Sanitary engineers.....	3
Chemists .....	3
Sanitary inspectors.....	10
Analysts.....	30
Nurses .....	3,500
Midwives.....	1,466
Malaria mantris.....	296
Laboratory technicians.....	226
Plague mantris and technicians.....	407
Vaccinator mantris.....	600
Health education mantris.....	300
Home visitors.....	12

The budget of the Ministry of Health, which covers most of the medical service and all of the public health service, was 5.2 percent of the national budget for 1951 or 6 rupiah per capita per annum, the equivalent of approximately 50 cents.

In general, it can be seen that the public

health problems are widespread and profound, complicated by great distances, poor communications, illiteracy, and poverty. The population, thinly spread in most areas but highly concentrated in Java, is increasing so rapidly that efforts to improve the standard of living scarcely can keep abreast of the increment. Sometimes the situation appears hopeless, but the potential wealth and delightful terrain of Indonesia plus the willingness and natural desire for a democratic way of life and general

temperament of the Indonesians themselves combine to present an inspiring challenge to make these thousands of islands one of the bright spots in this world. The exasperating contrast between what is and what could be—the obvious unreasonableness of it—places a tremendous burden of proof upon all the precepts of planning for human welfare.

NOTE. The photographs and map are supplied through the courtesy of the information division of the Embassy of Indonesia.

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## Heart Disease Screening in X-ray Surveys

Although chest X-ray surveys search primarily for undiscovered tuberculosis, any suspicious shadow on the photofluorogram deserves special attention, and film readers will uncover many unsuspected neoplasms and cardiovascular abnormalities. Through the years, it has been found that a significant number of persons with nontuberculous chest disease can be discovered in this way—an “extra dividend” of the tuberculosis survey.

The Lung Cancer Committee of the American Cancer Society, at its September 1952 conference in New Hampshire, recommended that the Society cooperate with other voluntary and official agencies in the conduct of X-ray screening programs.

The American Heart Association, the National Tuberculosis Association, and the Public Health Service urge also that every chest X-ray campaign be used to its full potential for heart disease case finding. To this end, the three organizations recently issued the following public statement:

“1. Local voluntary and official health and medical agencies should be urged to accept the responsibility for setting up procedures for referral for diagnostic follow-up and supervision of those cases of suspected heart disease that are found incidentally in the course of reading mass chest X-ray survey films for tuberculosis by

those qualified to read films for tuberculosis but without particular qualifications for reading for abnormal heart shadows.

“2. Facts accumulated to date do not justify, at present, a general recommendation to local voluntary and official agencies that any additional procedures (readings by cardiologists, recording of such items as height and weight, and self-completed history form) over and above those outlined in the preceding paragraph be added to mass chest X-ray screening programs in order to raise the level of case finding for heart disease, except on a special study basis.”

The practices of many communities have long been in accord with these principles, and the joint statement represents a crystallization of the experience of these communities.

No single satisfactory screening test, or combination of tests, has as yet been developed which could be justified solely as a way to detect heart disease before obvious signs and symptoms appear. That is why the epidemiological study now in progress at Framingham, Mass., under the auspices of the National Heart Institute includes “an appraisal of the value and efficiency of various methods and procedures for diagnosing heart disease.” As the Institute further points out: “This may lead to a simple way of quickly screening people to detect those who have heart disease.” In the meantime, however, community-wide chest X-ray surveys remain an opportunity for cardiovascular case finding that should not be overlooked.

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*From the Division of Chronic Disease and Tuberculosis, Public Health Service.*

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